

# Brief Report: Illness Uncertainty and Dispositional Self-Focus in Adolescents and Young Adults with Childhood-Onset Asthma

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**Objective** To investigate differences in self-focused attention between college students with childhood-onset asthma and a group of healthy controls and to determine whether self-focused attention mediates the relationship between illness uncertainty and psychological distress among individuals with asthma. **Methods** Forty-two adolescent and young adult participants with childhood-onset asthma and 40 age- and gender-matched healthy participants completed measures of self-focused attention, perceived illness uncertainty, psychological distress, and health status. **Results** Adolescents and young adults with childhood-onset asthma evidenced an increased tendency to engage in private self-focus compared to age- and gender-matched peers without a chronic illness history. Self-focused attention also mediated the relationship between perceived illness uncertainty and psychological distress among those with asthma. **Conclusions** The need for self-monitoring in asthma management may result in an increased propensity to self-focus, which may result in heightened levels of psychological distress.

**Key words** illness uncertainty; pediatric asthma; self-focused attention.

Studies increasingly demonstrate that asthma is almost as common in adolescents as it is among young children (Price, 1996). To date, limited research has been conducted to document adjustment outcomes in adolescents and young adults with childhood-onset asthma (Chaney, Hommel, Uretsky, & Mullins, 1999). Notably, research indicates that adolescents and young adults with asthma may be at a greater risk of engaging in substance abuse (Forero, Bauman, Young, Booth, & Nutbeam, 1996), experiencing high rates of school absenteeism (American Lung Association, 2003) and struggling with unemployment (Taitel, Allen, & Creer, 1998) compared to same-age peers. Research also suggests that adolescents and young adults with childhood-onset asthma experience higher levels of psychological distress compared to healthy peers (Silverglade, Tosi, Wise, & D'Costa, 1994) and normative samples (Mullins,

Chaney, Pace, & Hartman, 1997). Importantly, the extant literature has yet to identify which individual difference variables might predict poor psychological adjustment among adolescents and young adults with childhood-onset asthma.

Recent studies have implicated heightened levels of perceived illness uncertainty as a significant predictor of psychological distress among individuals with a variety of chronic illnesses (Hoff, Mullins, Chaney, Hartman, & Domek, 2002). Illness uncertainty refers to an individual's inability to understand illness-related events and/or predict disease-related outcomes (Mishel, 1990). Researchers have noted that the capricious nature of asthma often leaves those with the disease experiencing considerable uncertainty (Gatchel & Oordt, 2003). Indeed, illness uncertainty has predicted general psychological distress (Mullins et al., 1997) and self-reported

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anxiety (Hommel et al., 2003) in adolescents and young adults with childhood-onset asthma.

Recent studies have also identified self-focused attention as another potentially important cognitive appraisal variable among those with a chronic illness (Chaney et al., 1999; Chaney, Hommel, Uretsky, & Mullins, 2000; Griffin, Friend, Kaell, Bennett, & Wadhwa, 1999). Self-focus refers to the tendency to be more aware of self-referent, internally generated information than externally generated information that is taken in by the sensory receptors (Ingram, 1990). Self-focus includes both awareness of one's internal state, referred to as private self-consciousness, and awareness of oneself as a social object observed by others, referred to as public self-consciousness (Smith & Greenberg, 1981). Research on nonchronically ill depressed and nondepressed samples consistently suggests that high levels of private self-focus are associated with depression (Ingram, 1990). Further, higher levels of private self-consciousness have been related to depression and physical symptom reporting in a sample of adult patients with end-stage renal disease and to reports of depression in adult patients with rheumatoid arthritis (Griffin et al., 1999).

Chaney et al. (2000) examined the relationship between self-focused attention and health status by exposing adolescents and young adults with and without childhood-onset asthma to experimentally induced success or failure and then having them complete a problem-solving task either in front of or away from a mirror. Following experimentally induced failure, participants with childhood-onset asthma preferred to be in front of a mirror, whereas participants without asthma avoided the mirror. Chaney et al. (2000) suggested that individuals with childhood-onset asthma tend to engage in self-focus following failure, whereas those without asthma prefer to avoid self-focus following failure.

Chaney et al. (1999) suggest that asthma may lead to a tendency to be self-focused because effective asthma management requires a high degree of self-monitoring in order to observe internal signs of an impending attack. Self-focus may be adaptive in situations in which individuals are successful because they are likely to attribute success to themselves; however, self-focus may be maladaptive in situations in which individuals fail because they are likely to attribute failure to themselves (Fenigstein & Levine, 1984). Thus, the individual who is often self-focused may excessively attribute failure to internal rather than external causes, thereby increasing the risk for psychological distress.

In the current preliminary study, we examined the relationship between health status and self-focused

attention, specifically private self-consciousness, to further study the long-term outcomes of asthma diagnosed during the childhood years. We posited that given the need for individuals with asthma to scan their internal environments for signs of an impending asthma attack, they are likely to score higher on a measure of private self-consciousness than individuals without a history of childhood-onset asthma. Further, we hypothesized that self-focus may mediate the relationship between illness uncertainty and psychological distress. More specifically, we argue that the variable and unpredictable nature of asthma may result in high levels of illness uncertainty, which, subsequently, results in individuals scanning their internal and external environments for cues about their disease (i.e., increase in level of self-focus). This increased self-focus was hypothesized to be associated with heightened psychological distress.

## Method

### Participants

All participants were recruited through undergraduate psychology and marketing courses at a large Midwestern public university. All students in these classes were given the opportunity to complete a health-screening questionnaire that addressed the eligibility requirements for participants with and without asthma. Eligibility requirements for the participants with asthma required that they (a) had received a diagnosis of asthma before the age of 12, (b) had no other chronic illnesses (with the exception of allergic rhinitis), and (c) had a current prescription for an asthma-related medication or a physician's visit within the last 6 months for an asthma-related issue. Healthy control eligibility requirements dictated that the participant (a) had never been diagnosed with a chronic illness, (b) had never been treated by a physician for the same medical condition for more than six consecutive months, and (c) had never been hospitalized for more than two consecutive months for the same medical condition. After a participant with asthma completed the study, a healthy control participant of the same age and gender was randomly selected to participate. If the randomly selected participant did not want to participate, another age- and gender-matched peer was selected randomly until a willing participant was identified. The university institutional review board approved recruitment of participants and all study procedures.

Fifty-four participants with asthma were identified and recruited for the study. Of these, 43 (80%) agreed to participate in the study, but one failed to finish, yielding

a 98% completion rate. The final sample consisted of 42 participants (13 males and 29 females) with childhood-onset asthma. Forty of the 42 participants with asthma were matched with a same-age and same-gender peer without a chronic illness history (13 males and 27 females). Thus, the total sample consisted of 82 participants (26 males and 56 females). For analyses involving both the participants with and without asthma, only the 40 matched pairs were used to control for effects that might be because of age and gender. For analyses involving the matched pairs, if either member of the pair was missing a data point, the pair was not included in the analysis to maintain the matched nature of the design. For analyses involving only the participants with asthma, all 42 participants with asthma were used.

Participants' ages ranged from 18 to 22 years (mean = 19.5,  $SD = 1.25$ ). The self-reported racial composition of the sample was: 70 (85.4%) Caucasian, 5 (6.1%) American-Indian, 2 (2.4%) Asian, 2 (2.4%) biracial, 1 (1.2%) African-American, 1 (1.2%) Hispanic, and 1 (1.3%) did not report race. The racial composition of the sample closely reflects the racial composition of the student body from which the sample was drawn. Regarding parental education, 30 (71.4%) of the participants with asthma and 25 (62.5%) of the healthy control participants reported that the highest level of education achieved by at least one of their parents was a college or postcollege degree.

Mean age at the time of diagnosis was 7.8 years ( $SD = 3.4$ ). Participants' self-report of use of asthma medication was used to estimate asthma severity based on guidelines established by the National Heart, Lung, and Blood Institute (2002). Twenty-five participants (59.5%) were categorized as "mild intermittent," seven (16.7%) participants were categorized as "mild persistent," and seven (16.7%) participants were categorized as "moderate persistent." Three (7.1%) participants did not provide medication information and, therefore, could not be categorized. Three of the 42 (7.1%) participants with asthma reported also experiencing allergic rhinitis.

## Measures

### Background Information Questionnaire

A questionnaire was designed for the purpose of this study to collect demographic information and asthma-related information, including asthma participants' self-report of the type of asthma medication that they use and the frequency with which these medications are used.

### The Brief Symptom Inventory (BSI)

The BSI (Derogatis, 1993) yields measures of nine clinical dimensions of psychological distress. Respondents were asked to indicate on a 4-point scale the frequency

with which they experienced various psychological or physiological symptoms within the previous 7 days. Research indicates that the BSI has internal consistency ranging from .71 to .85 and possesses high test-retest reliability ranging from .68 to .91 (Derogatis, 1993). The Global Severity Index (GSI) score from the BSI was used to assess overall psychological distress. Cronbach's alpha for the GSI for this sample was .94.

### The Self-Consciousness Scale (SCS)

The SCS (Fenigstein, Scheier, & Buss, 1975) is a 23-item scale designed to assess individual differences in the tendency to focus one's attention on oneself. Respondents rate how much each statement applies to them on a Likert-type scale ranging from 0 ("extremely uncharacteristic of me") to 4 ("extremely characteristic of me"). The SCS yields three factor analytically derived scale scores (private self-consciousness, public self-consciousness, and social anxiety) and a total score. The private self-consciousness subscale (i.e., attention to one's inner thoughts and feelings) and the total score were used in the current study. Research has demonstrated the reliability, as well as the discriminant and construct validity, of the SCS total score as well as the subscale scores (Smith & Greenberg, 1981; Turner, Scheier, Carver, & Ickes, 1978). Notably, Fenigstein et al. (1975) found the test-retest reliability of the SCS to be .84 for the private self-consciousness subscale, .79 for the public self-consciousness subscale, and .73 for the social anxiety subscale with 2 weeks between each testing. Cronbach's alpha for the SCS total score for this sample was .80 and for the private self-consciousness scale was .68.

### The Mishel Uncertainty in Illness Questionnaire—Community Form (MUIS-C)

The MUIS-C (Mishel & Braden, 1988) purports to measure the four components of illness uncertainty: ambiguity, uncertainty, lack of information, and unpredictability. The scale contains 23 items that respondents are asked to rate on a 5-point scale ranging from "very true" to "very false." A composite score, with higher scores reflecting greater illness uncertainty, is obtained by summing all items. Reliability coefficients for the MUIS-C collected from 20 studies of individuals with a chronic illness ranged from .74 to .92 (Mishel, 1997). Cronbach's alpha for the current sample was .80. Only the participants with asthma completed the MUIS-C.

### Procedure

Participants completed questionnaire packets containing the four questionnaires used in the present study, as well as other measures that were part of a larger health study,

during individual 1-hr appointments in an on-campus research laboratory.

## Results

An independent samples *t* test was first conducted to determine whether the participants with and without asthma differed in their level of general psychological distress before the experiment. The analyses indicated that the two groups did not differ in their overall mean level of psychological distress as assessed by *t* scores on the BSI's GSI [ $t(1, 79) = 1.78, p = .08$ ], suggesting that the participants with asthma (mean = 53.58, *SD* = 11.48) were not more likely to be experiencing psychological distress than the participants without asthma (mean = 49.2, *SD* = 10.47). Notably, subsequent independent samples *t* tests indicated that participants with asthma evidenced higher mean scores on the private self-consciousness subscale (mean = 24.24, *SD* = 5.97) compared to the participants without asthma (mean = 22.16, *SD* = 4.88) [ $t(1, 72) = 1.64, p = .05$ ].

To assess whether self-focused attention mediated the relationship between illness uncertainty and psychological distress, a series of hierarchical multiple regressions were conducted in the manner of Baron & Kenny (1986) and Holmbeck (1997). Correlation analyses failed to reveal a relationship between asthma severity and regression variables; therefore, asthma severity was not controlled for in the regressions. Using simple linear regressions, a significant relationship was found between (a) the predictor variable (total score on the MUIS-C) and the mediator variable (total score from the SCS) [ $F(1,41) = 4.03, p = .05; \alpha = .30, p = .05, \text{power} = .52$ ] and (b) the predictor variable (MUIS-C) and the outcome variable (BSI-GSI) [ $F(1,41) = 5.89, p = .02; \alpha = .35, p = .02, \text{power} = .67$ ]. A third simultaneous multiple regression demonstrated a significant relationship between the mediator (SCS) and the outcome variable (BSI-GSI) [ $F(2, 41) = 8.46, p = .001; \alpha = .43, p = .003$ ], but the relationship between the predictor (MUIS-C) and the outcome (BSI-GSI) was no longer significant with the mediator (SCS) in the analysis ( $\alpha = .22, ns, \text{power} = .96$ ). Holmbeck (1997) notes that the loss of statistical significance in the presence of the mediator is a hallmark sign of mediation.

## Discussion

The purpose of the present study was to investigate differences between adolescents and young adults with and without asthma on a measure of self-focused attention,

as well as the ability of self-focused attention to mediate the relationship between illness uncertainty and psychological distress among individuals with asthma. Our results suggest that adolescents and young adults with asthma have an increased tendency to take their inner thoughts and feelings as the subject of their attention compared to their age- and gender-matched counterparts. Further, the results suggest that self-focused attention mediates the relationship between illness uncertainty and psychological distress.

Contemporary treatment of asthma has largely focused on the development of self-management programs that place the individual at the center of the management of their disease through the use of self-monitoring (Creer & Bender, 1995a,b). Although some research suggests that self-monitoring improves disease outcomes in children (Fritz & Wamboldt, 1998), the heightened need for internal monitoring of physical states may lead to increases in private self-consciousness. The increased need to be focused on one's internal physical environment to control asthma may inadvertently increase the likelihood that the individual will focus on his internal thoughts and feelings in general, compared to a healthy individual. Such reasoning is supported in light of our finding that individuals with long-standing asthma scored higher on measures of private self-focus. It is important to note, however, that the cross-sectional nature of the study's design precludes drawing conclusions about asthma causing increased levels of private self-focus.

The current findings are also interesting in light of the literature on symptom perception in childhood asthma. This literature consistently suggests that children and adolescents with asthma, as well as their parents, are often inaccurate in their estimations of symptom presence and severity (Rietveld, Prins, & Colland, 2001; Yoos, Kitzman, & McMullen, 2003). Over time, the inability to accurately detect symptoms may enhance a sense of frustration and anxiety, especially in the context of uncertainty about the illness. For some individuals, this sense of uncontrollability may then reinforce the tendency to self-focus. Again, this is speculative, and additional investigation is needed that examines the relationship between self-focus and symptom perception.

Illness uncertainty is another variable that is highly salient to the experience of asthma. The variable and unpredictable nature of asthma may result in individuals with asthma being more likely to scan their internal environment for signs of an impending asthma attack. Thus, the unpredictable nature of the illness may increase

the need for self-focused attention, and, as noted above, self-focused attention may increase the individual's risk for psychological distress. The often-observed relationship between illness uncertainty and psychological distress may be mediated by self-focused attention.

The current study has several limitations. First, the role of self-focused attention in the context of a chronic illness has received little theoretical attention or empirical investigation. Thus, additional studies with larger sample sizes are needed to replicate our findings. Such research should also address the possible contributions of other factors, such as illness severity and personal control, to the self-focus–distress relationship. Further, the rather homogeneous nature of our predominantly Caucasian, college-educated sample limits the generalizability of our findings to other ages, socioeconomic, and ethnic groups. Similarly, most participants with asthma in the study had mild asthma, which may limit the generalizability of the study's findings to geographically and demographically similar groups with more severe asthma. As well, the present study utilized a relatively small sample size, and the exclusive utilization of self-report measures makes shared method variance an additional concern. Asthma status and severity were based entirely on participants' self-report and were not verified by a medical professional.

Despite these limitations, this preliminary study highlights the potential importance of a relatively unexplored variable, self-focus, to the experience of having a chronic illness among adolescents, who are largely underrepresented in the asthma literature. Our results provide preliminary evidence that childhood-onset asthma may have long-term effects that impact psychological functioning for adolescents and young adults with asthma. Such results offer preliminary evidence that children with asthma may need continued monitoring and support centered on psychological health as they transition from childhood to older ages, even if the physical symptoms of asthma are no longer problematic.

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